Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) A system, comprising:

an exciter disposed to impinge at least one exciter beam onto a remote mass to excite the mass;

an optical probe disposed to impinge at least one optical beam onto a vibrating surface of the excited mass to be reflected thereby;

a compensated laser vibrometer disposed to detect at least part of the optical beam reflected by the vibrating surface of the excited mass and configured to generate signals indicative of the surface vibrations, the vibrometer including an adaptive photodetector for detecting a plurality of speckles from the optical beam reflected by the vibrating surface of the excited mass;

a processor configured to store and reverse the signals generated by the laser vibrometer; and

a modulator configured to modulate the at least one exciter beam generated by the exciter in accordance with the reversed signals.

2. (original) The system of claim 1, wherein the exciter is selected from the group of exciters comprised of laser sources configured to impinge at least one laser exciter beam onto the remote mass to excite the mass, and acoustic sources configured to impinge at least one acoustic exciter beam onto the remote mass to excite the mass.

3. (original) The system of claim 2, wherein the processor is configured to store the signals as a series of pulses and to reverse the stored pulses in a first in, last out (FILO) sequence.

4. (original) The system of claim 3, wherein the processor comprises:

a cache memory to store the signals.

5. (original) The system of claim 3, wherein the processor comprises:

a programmable delay line network.

6. (original) The system of claim 5, wherein the processor comprises:

a cache memory to store the signals.

7. (original) The system of claim 2, wherein the exciter is a pulsed laser source for impinging an optical beam onto the remote mass to excite the mass.

8. (canceled)

9. (canceled)

10. (original) The system of claim 2, further comprising:

a plurality of laser vibrometers disposed to detect a plurality of speckles from the optical beam reflected by the vibrating surface of the excited mass and configured to generate signals indicative of the surface vibrations.

11. (original) The system of claim 10, wherein the plurality of laser vibrometers are disposed in a predetermined array.

12. (original) The system of claim 11, wherein the predetermined array of laser vibrometers is a phased array.

13. (original) The system of claim 11, wherein the processor comprises:

a plurality of programmable delay line networks, each configured to store and reverse the signals generated by a respective one of the plurality of vibrometers.

14. (currently amended) A system, comprising:

a first laser source disposed to impinge at least one first optical beam onto a remote mass to excite the mass;

a second laser source disposed to impinge at least one second optical beam onto a vibrating surface of the excited mass to be reflected thereby;

a <u>compensated</u> laser vibrometer <u>with an adaptive photodetector</u> disposed to detect one or more speckles from the second optical beam reflected by the vibrating surface of the excited mass and configured to generate signals indicative of the surface vibrations;

a processor configured to store and reverse the signals generated by the laser vibrometer; and

a modulator configured to modulate the at least one first beam generated by the first laser source in accordance with the reversed signals.

15. (original) The system of claim 14, wherein the processor is configured to store the signals as a series of pulses and to reverse the stored pulses in a first in, last out (FILO) sequence.

16. (original) The system of claim 15, wherein the processor comprises:

a cache memory to store the signals.

17. (original) The system of claim 15, wherein the processor comprises:

a programmable delay line network.

18. (original) The system of claim 17, wherein the processor comprises:

a cache memory to store the signals.

19. (original) The system of claim 14, wherein the first laser source is a pulsed laser source.

20. (original) The system of claim 14, further comprising:

beam clean-up optics disposed to combine one or more speckles from the second optical beam reflected by the vibrating

surface of the excited mass into a single coherent beam for detection by the laser vibrometer.

21. (canceled)

22. (canceled)

23. (original) The system of claim 14, further comprising:

a plurality of laser vibrometers disposed to detect a plurality of speckles from the beam reflected by the vibrating surface of the excited mass and configured to generate signals indicative of the surface vibrations.

24. (original) The system of claim 23, wherein the plurality of laser vibrometers are disposed in a predetermined array.

25. (original) The system of claim 24, wherein the predetermined array of laser vibrometers is a phased array.

26. (original) The system of claim 24, wherein the processor comprises:

a plurality of programmable delay line networks, each configured to store and reverse the signals generated by a respective one of the plurality of vibrometers.

27. (currently amended) A time reversal mirror, comprising:

a <u>compensated</u> laser vibrometer <u>with an adaptive photodetector</u> disposed to detect one or more speckles from an optical beam reflected by a vibrating surface of a remote excited mass and configured to generate signals indicative of the surface vibrations;

a processor configured to store and reverse the signals generated by the laser vibrometer;

an exciter disposed to impinge an exciter beam onto the remote mass; and

a modulator configured to modulate the exciter beam in accordance with the reversed signals.

28. (original) The time reversal mirror of claim 27, wherein the exciter is selected from the group of exciters comprised of laser sources configured to impinge at least one laser exciter beam onto the remote mass, and acoustic sources configured to impinge at least one acoustic exciter beam onto the remote mass.

29. (original) The time reversal mirror of claim 28, wherein the processor is configured to store the signals as a series of pulses and to reverse the stored pulses in a first in, last out (FILO) sequence.

30. (original) The time reversal mirror of claim 29, wherein the processor comprises:

a cache memory for storing the signals.

31. (original) The time reversal mirror of claim 29, wherein the processor comprises:

a programmable delay line network.

32. (original) The time reversal mirror of claim 31, wherein the processor comprises:

a cache memory for storing the signals.

33. (original) The time reversal mirror of claim 27, wherein the exciter is a pulsed laser source for impinging an optical beam onto the remote mass to excite the mass.

34. (canceled)

35. (canceled)

36. The time reversal mirror of claim 27, further comprising:

a plurality of laser vibrometers disposed to detect a plurality of speckles from the optical beam reflected by the vibrating surface of the excited mass and configured to generate signals indicative of the surface vibrations.

37. (original) The time reversal mirror of claim 36, wherein the plurality of laser vibrometers are disposed in a predetermined array.

38. (original) The time reversal mirror of claim 37, wherein the predetermined array of laser vibrometers is a phased array.

39. (original) The time reversal mirror of claim 37, wherein the processor comprises:

a plurality of programmable delay line networks, each configured to store and reverse the signals generated by a respective one of the plurality of vibrometers.

40. (currently amended) A method, comprising:

selecting a compensated laser vibrometer configured to generate signals indicative of detected optical beams and including an adaptive photodetector;

disposing the laser vibrometer for the adaptive photodetector to detect one or more speckles from an optical beam reflected by a vibrating surface of a remote excited mass and to generate signals indicative of the surface vibrations;

providing the signals generated by the laser vibrometer to a processor to store and reverse the signals;

generating an exciter beam to impinge onto the remote mass to excite the mass; and

modulating the exciter beam in accordance with the reversed signals.

41. (original) The method of claim 40, wherein generating the exciter beam comprises:

generating an exciter beam selected from the group comprised of laser beams and acoustic beams.

42. (original) The method of claim 41, wherein providing the signals to the processor comprises:

providing the signals to the processor to store the signals as a series of pulses and to reverse the stored pulses in a first in, last out (FILO) sequence.

43. (original) The method of claim 41, wherein providing the signals to the processor comprises:

providing the signals to the processor to store and reverse the signals in a programmable delay line network.

44. (original) The method of claim 41, wherein generating the exciter beam comprises:

generating a pulsed laser beam.

45. (canceled)

46. (canceled)

47. (original) The method of claim 41, further comprising:

disposing a plurality of laser vibrometers to detect one or more speckles from the optical beam reflected by the vibrating surface of the remote excited mass, each laser vibrometer configured to generate signals indicative of the surface vibrations.

48. (original) The method of claim 47, wherein disposing the plurality of laser vibrometers comprises:

disposing the plurality of laser vibrometers in a predetermined array.

49. (original) The method of claim 48, wherein disposing the plurality of laser vibrometers comprises:

disposing the plurality of laser vibrometers in a phased array.

50. (original) The method of claim 48, wherein providing the signals to the processor comprises:

providing the signals to the processor to store and reverse the signals generated by each one of the plurality of vibrometers in a respective one of a plurality of programmable delay line networks.